Amendments to the Claims:

1. (Currently Amended) An MRI system comprising:

~~a means for~~ an RF transmit system configured to ~~creating~~ create and ~~transmitting~~ transmit RF pulses into an examination region to excite and manipulate a spin system to be imaged;

a ~~means for picking~~ plurality of receive coil configurations, each receive coil configuration being configured to pick up an MR signal emitted from the examination region [[(14)]] and output the picked-up MR signals on n receive coil outputs, different ones of the receive coil configurations having a different number of the outputs, where n is an integer;

a ~~means for demodulating~~ plurality of receivers configured to demodulate the MR signals from the receive coil outputs and ~~converting~~ convert the demodulated MR signal into a plurality of streams of digital data, when the selected receive coil configuration has fewer outputs than the number of receivers, only n of the receivers connected to the n outputs of the selected receive coil configurations are used; and

~~a means for reconstructing images from the digital data, which includes:~~

a plurality of processing units[[,]] ~~which include~~ are dynamically ~~reconfigurable connections~~ reconfigured into a plurality of stages of parallel processing channels, each parallel processing channel being connected with one of the n used receivers, such that the processing units are reconfigured in accordance with the number of used receivers.

2. (Previously Presented) The MRI system as set forth in claim 1, wherein the plurality of processing units includes embedded processors.

3. (Previously Presented) The MRI system as set forth in claim 1, wherein the plurality of processing units includes one of personal computers and workstations.

4. (Previously Presented) The MRI system as set forth in claim 1, wherein the processing units are dynamically reconfigured utilizing a switched fabric, a crossbar or the like.

5. (Cancelled)

6. (Currently Amended) The MRI system as set forth in claim [[5]] 1, wherein each of the ~~independent~~ parallel processing channels ~~further include: one or more pipeline stages~~ are independent.

7. (Previously Presented) The MRI system as set forth in claim 6, wherein each of the independent parallel processing channels further include:

a first pipeline stage to operate on the digital data in k-space;

one or more intermediate pipeline stages to transform the digital data from k-space to an image domain; and

a final pipeline stage to operate on the digital data in the image domain.

8. (Currently Amended) The MRI system as set forth in claim [[6]] 1, further including:

a combining unit[[,]] operatively connected to the processing units allocated to [[a]] final pipeline stages of the parallel processing channels, to ~~manipulate~~ combine outputs of ~~each~~ all of the parallel channels.

9. (Previously Presented) The MRI system as set forth in claim 8, wherein the combining unit weights the output of each channel and sums the weighted outputs.

10. (Previously Presented) The MRI system as set forth in claim 8, wherein an exchange of the data generated by the independent processing channels is restricted to an image domain and further includes:

one of the exchange of the data via the processing units allocated to the final pipeline stage and via the combining unit.

11. (Cancelled)

12. (Currently Amended) ~~The~~ A method ~~as set forth in claim 11, further including~~ for processing MR signals comprising:

(a) connecting a selected one of a plurality of receive coil configurations with an MR scanner that has m RF receivers, where m is an integer, the MR scanner having more than m processing units, each of the receive coil configurations having n received signal outputs for connection with n of the m RF receivers of the MR scanner, were n is a variable integer less than or equal to m, different receive coil configurations having a different number n of outputs such that n of the receivers are used;

(b) dynamically reconfiguring the processing units connections in accordance with the number of outputs of the selected receive coil configuration to allocate the processing units to form pipeline stages for processing channels ~~and pipeline stages on a per scan basis~~ connected with the n used receivers;

(c) creating and transmitting RF pulses into an examination region to excite and manipulate a spin system to be imaged;

(d) picking up the MR signal emitted from the examination region with the selected receive coil configuration;

(e) demodulating the picked-up MR signal from each of the receive coil configuration outputs with one of the n used receivers and converting the n demodulated MR signals into n streams of digital data;

(f) reconstructing images from the digital data via the plurality of processing units which were dynamically reconfigured into pipeline processing channels;

(g) repeating steps (a)-(f) with a different one of the receive coil configurations which has a different number n of the outputs.

13. (Cancelled)

14. (Currently Amended) The method as set forth in claim [[11]] 12, further including:

interconnecting the processing units to arrange the processing units into a plurality of independent parallel processing channels, each channel being operatively connected only with one or more of the n used RF receivers; and

reconstructing the images from the digital data via independent processing in each independent processing channel.

15. (Currently Amended) The method as set forth in claim 14, wherein the processing units in each ~~independent parallel~~ processing channel are arranged into a plurality of independent parallel pipeline stages.

16. (Original) The method as set forth in claim 15, further including:

weighing an output of each processing channel; and

one of partial and complete combining of the weighed outputs.

17. (Currently Amended) The method as set forth in claim 16, wherein the combining is performed in a final pipeline stage and includes:

combining an image from a first processing channel with an image from an adjacent processing channel to form a first intermediate combined image, and

combining an image from [[a]] another one of the processing channels [[n]] with an image from an adjacent processing channel to form a second intermediate combined image; and

combining each intermediate combined image with an image from another processing channel to generate new intermediate combined images until images from all processing channels have been combined into a resultant combined image.

18. (Currently Amended) The method as set forth in claim 17, further including:

distributing the resultant combined image to the processing units allocated to [[the]] a final pipeline stage by consecutively forwarding the resultant combined image from [[the]] a middle processing channel in direction of [[the]] a last processing channel and simultaneously forwarding the resultant combined image in opposite directions from the middle channel in direction of the last channel via adjacent processing units.

19. (Currently Amended) The method as set forth in claim 16, wherein the combining [[is]] steps are performed in a final pipeline stage and includes:

combining images from pairs of processing channels into intermediate combined images; and

combining pairs of the intermediate combined images until images from all processing channels have been combined into a resultant combined image.

20. (Currently Amended) The method as set forth in claim 19, further including:

distributing the resultant combined image to the processing units [[(52)]] allocated to [[the]] a final pipeline stage [[(54_m)]] by consecutively forwarding the resultant combined image from [[the]] a middle processing channel [[($42_{n/2}$)]] to [[the]] a last processing channel [[(42_n)]] and simultaneously forwarding the resultant combined image in opposite directions from the middle processing channel [[($42_{n/2}$)]] to the last channel [[(42_n)]] via adjacent processing units.

21. (Currently Amended) ~~The~~ A method ~~as set forth in claim 14, further including~~ for processing an MR signal comprising:

creating and transmitting RF pulses into an examination region to excite and manipulate a spin system to be imaged;

picking up the MR signal emitted from the examination region;

demodulating the picked up MR signal and converting the demodulated MR signal into digital data; and

reconstructing images from the digital data via a plurality of processing units, which include dynamically reconfigurable connections, including:

mapping a forward processing of iterative reconstruction algorithms to the pipeline stages [[(54_1, 54_2, …, 54_m)]];

mapping a backward processing of the iterative reconstruction algorithms to the pipeline stages [[(54_m, 54_{m-1}, …, 54_1)]]; and

simultaneously performing the forward and backward processing of different data sets, such that:

a first pipeline stage [[(54_1)]] operates on the digital data in k-space, and

a final pipeline stage [[(54_m)]] operates on the digital data in an image domain.

22. (Original) The method as set forth in claim 21, further including:

utilizing two separate independent parallel processing channels for the forward and backward processing of iterative reconstruction algorithms.

23. (New) The method as set forth in claim 1, wherein when the number n of used receivers is small, the processing units are dynamically reconfigured to provide a smaller number of parallel processing channels with a larger number of stages in each of the parallel processing channels and when the number n of used receivers is relatively large, the processing units are dynamically reconfigured to provide a larger number of parallel processing channels each having a smaller number of stages.

24. (New) The MRI system as set forth in claim 10, wherein the output of the final pipeline stage of each parallel processing channel is an image such that the combining unit combines images.

25. (New) The method as set forth in claim 12, wherein the reconstructing step includes an iterative reconstruction in which

each processing channel generates an image; and

a combination of images from the channels is fed back to earlier stages in the processing channels.

26. (New) The method as set forth in claim 12, wherein dynamically reconfiguring includes reconfiguring the processing units to form n processing channels with more processing units per channel when n is smaller and fewer processing units when n is larger.